**Amendments to the Claims:**

## CLAIMS:

1.    (Withdrawn)  A regulated unit comprising:

a semiconductor chip having logic circuits comprising at least one delay path that is dependent at least in part on a voltage value of a supply voltage applied to the semiconductor chip;

a voltage regulator coupled to the semiconductor chip capable of changing the voltage value of the supply voltage;

a thermal sensor on the semiconductor chip capable of sensing a temperature on the semiconductor chip; and

a voltage controller coupled to the voltage regulator and to the thermal sensor, the voltage controller capable of causing the voltage regulator to change the voltage value of the supply voltage;

wherein the voltage controller improves a timing margin of the at least one delay path on the semiconductor chip by dynamically controlling the voltage regulator to produce a supply voltage at or near a particular voltage value that causes the chip to operate at or near a limit temperature, the particular voltage being between a low limit voltage and a high limit voltage.

2.    (Withdrawn)  The regulated unit of claim 1, the semiconductor chip further comprising a timer coupled to the voltage controller, the timer capable of signaling to the voltage controller upon the end of an elapsed time interval.

3.    (Withdrawn)  The regulated unit of claim 2, wherein the timer is programmable as to the elapsed time interval.

4.    (Withdrawn)  The regulated unit of claim 1, the semiconductor chip further comprising a storage containing at least one element of product data associated with the regulated unit.

5.    (Withdrawn)  The regulated unit of claim 4, the at least one element of product data including the low limit voltage.

6.  (Withdrawn) The regulated unit of claim 4, the at least one element of product data including the high limit voltage.

7.  (Withdrawn) The regulated unit of claim 4, the at least one element of product data including the limit temperature.

8.  (Withdrawn) The regulated unit of claim 4, the at least one element of product data including one or more thermal data values that are used by the voltage controller to determine a rate of increase or decrease of the voltage value.

9.  (Withdrawn) A subassembly comprising one or more instance of the regulated unit of claim 1.

10. (Withdrawn) A computer system comprising one or more instance of the subassembly of claim 9.

11. (Currently Amended) A method of improving timing margin of at least one path on a semiconductor chip coupled to a voltage supply comprising the steps of:

    operating the semiconductor chip at a first voltage value of the voltage supply;

    detecting if a thermal fault exists;

    if a thermal fault is detected, lowering the voltage supply to a second voltage value lower than the first voltage value; and

    if, after elapse of a first predetermined time interval, a thermal fault is not detected, improving timing margin of at least one path on the semiconductor chip by performing the steps of:

    > raising the voltage supply to a third voltage value higher than the first voltage value; and

    > not changing a frequency of operation of the semiconductor chip.

12. (Original) The method of claim 11, further comprising the step of waiting for a subsequent elapse of a second predetermined time interval after lowering the voltage supply to the second voltage before again lowering the supply voltage.

13. (Original) The method of claim 11, further comprising the step of reading product data on a storage on the semiconductor chip.

14. (Original) The method of claim 13, wherein the product data includes a low limit voltage value.

15. (Original) The method of claim 14, wherein if the second voltage value is less than the low limit voltage value a fault signal is activated indicating an uncorrectable thermal fault has occurred.

16. (Original) The method of claim 13, wherein the product data includes a high limit voltage value.

17. (Original) The method of claim 16, wherein if, after the predetermined elapsed time, a thermal fault is not detected, but the third voltage value cannot be increased without exceeding the high limit voltage value, the third voltage value is not changed.

18. (Original) The method of claim 11 further comprising the step of changing the first predetermined time interval to a second predetermined time interval.

19. (Currently Amended) A program product comprising computer readable instructions, distributed on a computer readable media, that, when executed on a suitable computer, performs the steps of the method of claim 11.

20. (Withdrawn) A method of improving timing margin of at least one path on a semiconductor chip coupled to a voltage supply comprising the steps of:

reading a limit temperature;

reading a first temperature on the chip with a thermal sensor and storing the first temperature;

initializing a timer to a first predetermined time interval;

starting the timer;

waiting for the timer to elapse;

reading a second temperature on the chip with the thermal sensor after the elapse of the timer;

computing a rate of temperature increase;

using the second temperature and the rate of temperature increase, and the limit temperature, computing a time to limit temperature value; and

using the time to limit temperature value, changing a voltage supplied by the voltage supply.

21.    (Withdrawn)  The method of claim 20, further comprising the step of:

using the time to limit temperature value, changing the first predetermined time interval to a second predetermined time interval.

22.    (Withdrawn)  The method of claim 20, further comprising the steps of:

ensuring that a high limit voltage is not exceeded by the voltage supplied by the voltage supply; and

ensuring that the voltage supplied by the voltage supply is not less than a low limit voltage.

23.    (Withdrawn)  A program product comprising computer readable instructions that, when executed on a suitable computer, performs the steps of the method of claim 20.